

NORTH PACIFIC OCEAN, APRIL 1935

By WILLIS E. HURD

Atmospheric pressure.—The average pressure situation over the North Pacific Ocean during April 1935, showed a fairly well developed low-pressure belt overlying southwestern Alaskan waters and the neighborhood of the Aleutian Islands; a high-pressure belt extending from southeastern Alaska southward to middle latitudes and thence westward into east longitudes, with the crest near Midway Island; and a shallow tropical low-pressure belt, which was of pronounced depth over the southwestern part of the ocean.

Pressures were decidedly above the normal in the northern Pacific, where strong anticyclones prevailed early and late in the month, and below the normal in waters of California and in the tropics.

TABLE 1.—Averages, departures, and extremes of atmospheric pressure at sea level, North Pacific Ocean, April 1935, at selected stations

Stations	Average pressure	Departure from normal	Highest	Date	Lowest	Date
	<i>Inches</i>	<i>Inch</i>	<i>Inches</i>		<i>Inches</i>	
Point Barrow.....	30.30	+0.21	30.86	12	29.94	23
Dutch Harbor.....	29.85	+ .07	30.60	26	28.84	15
St. Paul.....	29.97	+ .18	30.86	27	29.14	15
Kodiak.....	29.83	+ .08	30.66	27	28.90	16
Juneau.....	29.99	+ .03	30.70	26	29.32	18
Tatoosh Island.....	30.00	.00	30.43	25	29.47	22
San Francisco.....	29.97	— .08	30.22	6	29.44	7
Mazatlan.....	29.87	— .02	29.96	2	29.80	12
Honolulu.....	30.06	.00	30.14	28	29.91	1
Midway Island.....	30.13	+ .01	30.30	7, 16	29.84	28
Guam.....	29.81	— .08	29.86	21	29.76	28
Manila.....	29.79	— .03	29.84	1, 15, 16, 20, 21, 22	29.72	5, 6
Hong Kong.....	29.83	-----	30.07	1	29.67	9
Naha.....	29.90	— .02	30.12	1	29.74	28
Chichishima.....	29.97	.00	30.14	3	29.68	19
Nemuro.....	29.94	-----	30.36	8	28.92	30

NOTE.—Data based on 1 daily observation only, except those for Juneau, Tatoosh Island, San Francisco, and Honolulu, which are based on 2 observations. Departures are computed from best available normals related to time of observation.

Cyclones and gales.—Storm conditions decreased materially over the North Pacific from March to April. No deep cyclones entered the western part of the ocean from Asia until the end of the month, when a storm with pressure readings below 29 inches crossed northern Japan on the 30th, accompanied by a strong gale on the south coast of Hokushu. Several cyclones of moderate intensity in immediate Japanese waters developed considerably in strength over the ocean in their passage toward Aleutian waters. This was particularly true of the Hokushu Low of April 5, which caused fresh to strong gales to the eastward on the 6th, and a gale of force 11 near 48° N. 163° E., on the 7th. Another depression, which left Japan on the 11th, caused fresh to strong gales as far to the eastward as 165° E. on the 12th to 14th.

Gales to the southward of the Aleutian Islands, between 40° and 50° N. 170° E. and 150° W., resulted from the activities of the great low-pressure system in these waters. On several days scattered gales in this region did not exceed 8 in force, but on the 3d, 4th, 16th, 18th, 21st, 22d, 23d, and 29th, forces of 9 to 10, likewise scattered as to distribution, occurred.

On the 22d the severest extra-tropical gale of the month, of force 12 from the east, was reported by the British steamship *Tymeric* near latitude 47° N. longitude 172° W. This ship encountered much rough weather on the 21st–23d, during an eastbound voyage to Portland, and was forced on several occasions to heave to on account of the

strong winds and high seas. Her lowest corrected barometer on the 22d was 28.83 inches, which, with an identical reading reported by the Japanese motorship *Tokai Maru* near 44° N. 166° E. on the 2d, was the lowest pressure reading of the month outside of the tropics. The lowest land reading in high latitudes was 28.84 inches, at Dutch Harbor on the 15th.

Between 150° W. and the American coast few gales occurred and these principally in connection with moderate disturbances on the California-Hawaiian routes during the early half of the month.

Typhoon.—One small typhoon crossed the Philippines early in the month, causing considerable loss of life and property damage on the island of Samar. The lowest pressure reported was 27.97 inches, accompanied by hurricane winds, at Borongan. A history of the disturbance will be found in the subjoined report by the Rev. B. F. Doucette.

Tehuantepecer.—On the 13th a norther gale, force 10, was encountered by the American steamer *Kentuckian* in the Gulf of Tehuantepec. In an observation from Vera Cruz, on the Mexican east coast, a north gale of force 9 was reported on the same date.

Fog.—Along most of the American coast fog increased materially from March to April. It occurred on 10 days between Cape Blanco and Point Conception, and on 6 days between San Diego and Cape Corrientes. Occasional fog was met with along the northern steamship routes, with the region of greatest frequency—2 or 3 days in each 5° square—between 165° E. and the northern half of the Japanese coast.

TYPHOON OVER THE FAR EAST, APRIL 1–9, 1935

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[Weather Bureau, Manila, P. I.]

In the early part of April 1935 a small yet intense typhoon appeared over the Western Caroline Islands and moved toward the Philippines. It passed over the Island of Samar, leaving a narrow path in which severe destruction was experienced, and moved on a northwest course to Central Luzon, weakening as it crossed this island on its way to the China Sea. As the barometric minimum at Borongan showed, the typhoon was well developed and very deep, although small in area.

The approximate positions determined after data from ships had been copied and complete records had been received from stations along the course of the typhoon, are given below.

April 1, 2 p. m.	About 200 miles ESE. of Yap	
	Latitude	Longitude
April 2, 6 a. m.	10	139
April 3, 6 a. m.	11	30 135
April 4, 6 a. m.	12	30 131 30
April 5, 6 a. m.	13	00 130
April 6, 6 a. m.	11	30 125 30
April 7, 6 a. m.	13	30 122 10
April 8, 6 a. m.	16	30 119
April 9, 6 a. m.	20	00 119

Forming ESE. of Yap, the typhoon moved WNW. for 3 days, decreasing its speed as it proceeded. It began to move more rapidly during the night of April 5, inclining to the WSW. The morning of the 6th found it over the Island of Samar, between Borongan and Guiuan, two stations on the eastern coast, and very close to the former station. It now changed to a NW. course, passing over Catbalogan and Calbayog, two stations on the western coast of Samar, the calm area being experienced at Catbalogan. Over the western portion of San Bernardino

Strait, the storm remained stationary or moved very, very slowly, for many hours during the day (Apr. 6); then during the night it moved to a position between the Island of Marinduque and Bondoc Peninsular (Apr. 7, 6 a. m.). It now moved slowly to a position between Infanta, Tayabas, and Manila (Apr. 7, 2 p. m.), passing close to and south of Infanta and beginning to weaken. It continued on this NW. course, crossing Central Luzon and entering the China Sea as a depression.

A few remarks are in order concerning the positions given for April 4 and 5. These are based upon a few ships' reports copied from their logs upon arrival at Manila. Judging by the observations made at Borongon and Guiuan, the typhoon approached these stations on a westerly course, indicating that the positions given above may be too far north.

The barometric minima recorded by Weather Bureau stations near the track of the typhoon are of interest. Borongon recorded the low minimum of 710.38 mm (27.968 in.) with winds of force 12 from the N., April 6, 6 a. m. Guiuan had 739.28 mm (29.106 in.) with winds of force 9 from the WSW., April 6, 6:30 a. m. Infanta, Tayabas had a minimum of 748.84 mm (29.482 in.) with winds of force 10 from the NE., April 7 at 1:50 p. m. Three hours later, however, the wind was only force 6 and from the SSW., an indication of the rapid decrease in intensity of the typhoon as it was moving into Central Luzon. At Catbalogan and Calbayog, instruments and records were lost, due to the intense winds, and no dependable values of the pressure at those locations are available.

Concerning the loss of life, there were 37 dead in Samar, 22 in Tayabas Province, and 1 in Sorsogon Province, according to official reports. Besides the total of 60 given above, an uncertain number of fishermen from the town of Guinayangan, Tayabas, were lost. The Manila newspapers, April 11, reported that 100 fishermen had set out over the northern part of Ragay Gulf during the night of April 6 and, of this number, only 17 bodies, washed up on the shore could be found. Then, an unofficial report given out by the papers, April 15, stated that 16 fishing boats manned by 78 men were caught by the typhoon. Of these men, 58 were accounted for and only 20 were missing. Further investigation is required for an accurate report. The property loss consisted of extensive destruction to light-material houses and considerable damage to strong-material buildings. The town of San Narciso, on the eastern coast of Bondoc Peninsula, was practically ruined. The mail boat at San Narciso, was thrown upon the shore. Along the course of the typhoon, up to the point where it began to weaken, rice and coconut crops suffered.

There are some aspects connected with this typhoon which may be of interest to readers of the MONTHLY WEATHER REVIEW. On April 4 and 5, the typhoon was over the ocean, moving slowly toward the archipelago. It increased its speed just as an anticyclone to the north increased in intensity, and approached the Island of Samar quite rapidly. Once the typhoon was over the archipelago, it could be seen that there was no extensive current of Southwest Monsoon air. While the typhoon was situated over the western portion of San Bernardino Strait (Apr. 6) between Masbate Island and Sorsogon Province, Surigao, Cebu and Iloilo reported SW. winds (the typhoon being 120 to 150 miles away). Judging from data available at the present writing, this current of air apparently did not extend any further to the southwest.

During the few days preceding the appearance of the typhoon, the pilot-balloon-ascension reports received by radio from the United States naval station at Guam have some points of interest. The 6 a. m. ascents show that the air currents were from the ENE. on March 30 at velocities of 8 and 9 m. p. s. up to 3,000 meters, then decreasing aloft. On March 31, however, the direction remaining practically ENE., there is an increase of velocity of the air stream (12 m. p. s.) with indications of stratification; that is, an increase and decrease and then increase of velocity with altitude. On April 1, the velocity remains the same as the preceding day, but the direction is shifting to the ESE. at 1,500 meters. On April 2, with velocity remaining the same, the current of air is now from the SE. up to 3,000 meters. Rain prevented an ascent on the 3d. During the afternoon of April 1, the typhoon was forming about 400 miles SSW. of the station.

At Manila, through the kindness of United States Army officials at Nichols Field and at Fort Mills, the writer obtained the records of morning ascents from April 1 to 5, showing the air currents over Manila as the typhoon approached Samar Island, which is about 300 miles southeast of the city. The pilot-balloon data show an ENE. current aloft varying irregularly in intensity. On April 3, 7 a. m., this ENE. current increased from 5 m. p. h. to 20 m. p. h. up to 1,500 meters, then decreased to 9 m. p. h. at 2,500 meters, then increased to 19 m. p. h. at 4,000 meters. The typhoon was, at this time, about 900 miles to the ESE. of Manila. On April 4, there were ENE. and NE. winds aloft, steadily increasing with altitude to 24 m. p. h. at 2,500 meters, and then decreasing to 12 m. p. h. at 3,500 meters and then increasing to 20 m. p. h. at 4,500 meters, the typhoon now being about 600 miles ESE. of the city. On April 5, when the typhoon was about 500 miles away from the city, the ascent is almost a duplicate of that of the preceding day, except that the velocities at 4,500 meters are weaker. After studying records of ascents made during the latter part of 1934 at Guam and at Manila, a period when typhoons formed frequently and moved rapidly, the writer has received the impression that this stratified condition of the atmosphere as manifested in pilot-balloon ascension reports, may be used in forecasting the progress of the typhoon as well as for giving information concerning its structure.

SEA-SURFACE TEMPERATURE SUMMARY FOR THE NORTHWESTERN GULF OF MEXICO, 1912-33

By GILES SLOCUM

The monthly mean sea-surface temperatures in a representative area in the northwestern quadrant of the Gulf of Mexico are given in the accompanying table. The period covered is from January 1912 to December 1933, inclusive. There are 2 months, as noted in the table, for which no observational data are available. The observations of sea-surface temperatures for the years 1917, 1918, and 1919 are few in number, and the average temperatures are given to whole degrees for these years. For the other years, with a larger number of observations, the mean values are given to tenths of a degree.

The area in which these temperature observations were taken embraces six 1° squares, namely, between 90° W. and 93° W. and between 27° N. and 29° N.